




# Module 2

## Photography Basics



## Some Photography and Camera Basics

- Introduction to a camera
- Grain Size/Pixel Size
- ISO
- F-Stop
- Depth of Field
- Lens Length
- Lighting/White Balance



## Some Photography and Camera Basics

But also

- Basic lighting/back lighting
- Focusing
- Basic composition



## The Digital Camera



## Cell Phone Cameras



## Scene selection

### Shooting Suited for the Scene (Scene Mode)

Camera settings are automatically optimized for the selected scene type. The following scene modes are available.

Portrait	Beach/snow	Close-up	Backlight
Landscape	Sunset	Food	Panorama assist
Night portrait	Dusk/dawn	Museum	
Party/indoor	Night landscape	Copy	

### Selecting a Scene Mode

- 1 Press in shooting mode to display the shooting-mode selection menu and use the multi selector ▲ and ▼ to select scene mode.

- The icon of the last scene mode used is



More on Shooting

## Scene selection



### Nomenclature

#### Mode Dial

The Mode Dial consists of two functionally categorized zones: one for the Creative Zone modes and one for the Basic Zone modes.

#### Creative Zone

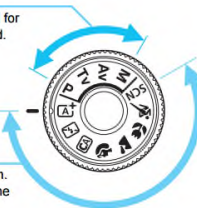
These modes give you more control for shooting various subjects as desired.

- P** : Program AE (p.148)
- Tv** : Shutter-priority AE (p.150)
- Av** : Aperture-priority AE (p.152)
- M** : Manual exposure (p.155)

#### Basic Zone

All you do is press the shutter button. The camera sets everything to suit the subject or scene for shooting.

- [A+]** : Scene Intelligent Auto (p.66)
- [Flash Off]** : Flash Off (p.71)
- [CA]** : Creative Auto (p.72)
- [Portrait]** : Portrait (p.76)
- [Landscape]** : Landscape (p.77)
- [Close-up]** : Close-up (p.78)
- [Sports]** : Sports (p.79)
- SCN** : Special scene (p.80)
  - [Kids]** : Kids (p.81)
  - [Food]** : Food (p.82)
  - [Candlelight]** : Candlelight (p.83)
  - [Night Portrait]** : Night Portrait (p.84)
  - [Handheld Night Scene]** : Handheld Night Scene (p.85)
  - [HDR Backlight Control]** : HDR Backlight Control (p.86)



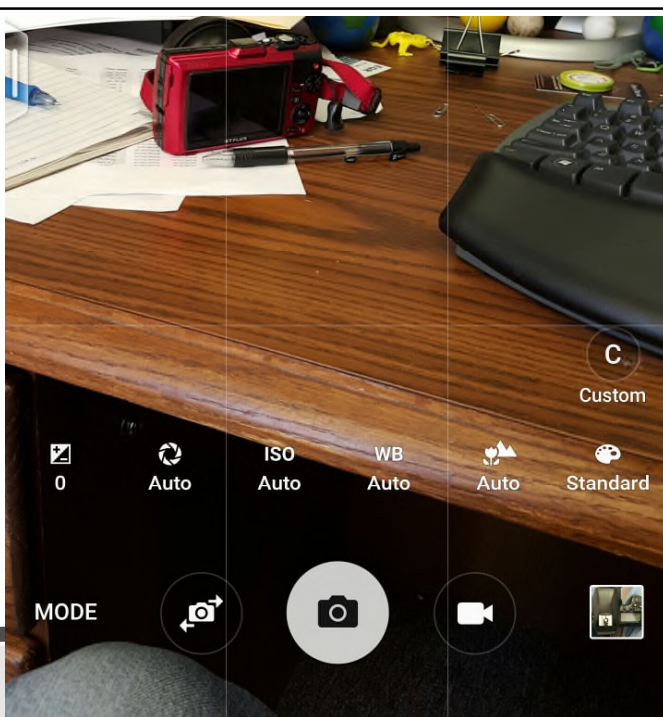
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## Scene selection





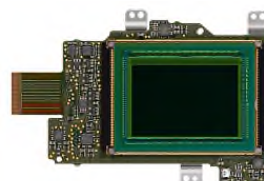
## Scene selection



## What do all cameras have in common?

They have:

- An image sensor
- Electronics
- A lens
- Storage



## Image Sensors in Digital Cameras and Phones

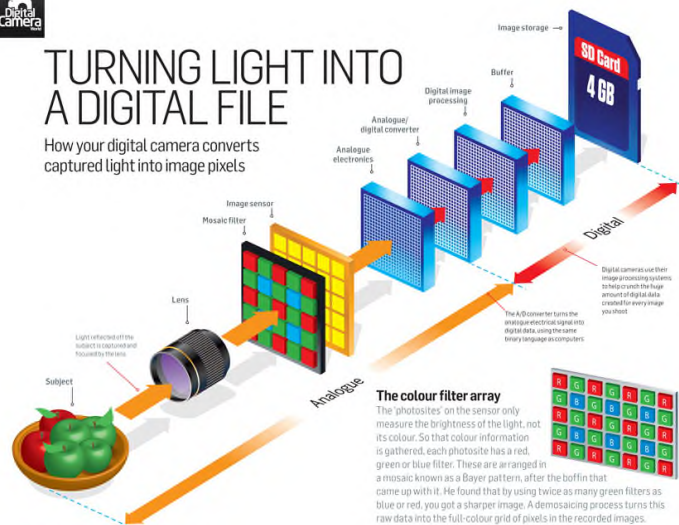


## Image Sensors in Digital Cameras and Phones



### TURNING LIGHT INTO A DIGITAL FILE

How your digital camera converts captured light into image pixels



[www.digitalcameraworld.com](http://www.digitalcameraworld.com)



## Grain size and pixel size

Canvas Size: 20 x 20 px 40 x 40 px 200 x 200 px  
Resolution: 9 DPI 18 DPI 90 DPI

10 PPI 20 PPI

2,54 cm 2,54 cm

## Pixels

## Sensor size

Full-frame  
Four Thirds  
Smaller Cell Phone

Mega Pixels  
1MP-24MP



## Digital Cameras

Color	Quality	Comments	PPI Range
	Superb	Just about the finest quality possible.	200+ PPI
	Excellent	The casual photographer will see no difference to a slight difference when compared to Superb.	150-199 PPI
	Better	Better than Good, but not as good as Excellent. The typical photographer will be very happy with prints of this quality.	100-149 PPI
	Good	Quality that your typical photographer will be happy with.	80-99 PPI
	Fair	Quality will depend on the individual picture. For larger size prints the typical photographer will find them acceptable, but the sharpness will not be as high as a Good quality print. Compelling subject matter may trump the loss of sharpness. But doesn't it always?!	79 PPI or less

		PRINT SIZE								
		8x12	11x14	16x20	16x24	20x30	24x36	30x45	40x60	50x75
CAMERA RESOLUTION	2MP	133	114	80	66	60	53	35	26	21
	3MP	193	165	115	96	77	64	51	38	30
	4MP	205	176	123	102	82	68	54	41	32
	5MP	216	185	129	121	86	72	57	43	34
	6MP	250	214	150	125	100	83	66	50	40
	7MP	256	219	153	128	102	85	68	51	40
	8MP	259	222	155	129	103	86	69	51	41
	9MP	290	249	174	145	116	96	77	58	46
	10MP	322	276	193	161	129	107	86	64	51
	11MP	338	290	203	169	135	112	90	67	54
	12.7MP	364	312	218	182	145	121	97	72	58
	16.6MP	416	356	249	208	166	138	110	83	66
	18MP	408	350	245	204	163	136	108	81	65
	21.1MP	468	401	280	234	187	156	124	93	74
	22MP	457	392	274	228	182	152	121	91	73
	31MP	541	464	324	270	216	180	133	108	86
	39MP	601	515	360	300	240	200	160	120	96
	63MP	812	696	487	406	324	270	216	162	129
	35mm*	590	515	354	295	236	196	157	118	94
6x6cm	944	809	566	472	377	314	251	188	151	
6x7cm	956	820	574	478	382	318	255	191	153	
4x5	988	847	592	494	395	329	263	197	158	
8x10	1383	1186	830	691	553	461	368	276	221	



## The Image Sensor: Grain Size and Pixel Size



ISO (ASA) 60 – 3200

- The lower the number the smaller the grain
- The lower the number the less sensitive to light



## ISO - 100



## ISO - 3200



## Grain size


The bigger the grain

~

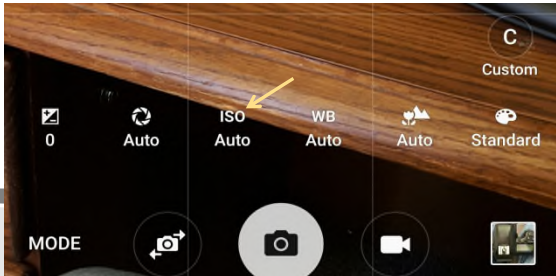
The more light it could harvest

But less sharpness/precision!


## ISO setting



A close-up photograph of the top of a black DSLR camera. The ISO button is visible, along with the 'RESET' button and the 'WB' (White Balance) button. The 'LIGHT' button is also partially visible.



A photograph of a camera's LCD screen displaying the menu. The 'ISO' option is highlighted with a yellow arrow, and the current setting is 'Auto'. Other menu options visible include '0', 'Auto', 'WB Auto', 'Auto', 'Standard', 'C Custom', and 'MODE'.



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## ISO-Auto



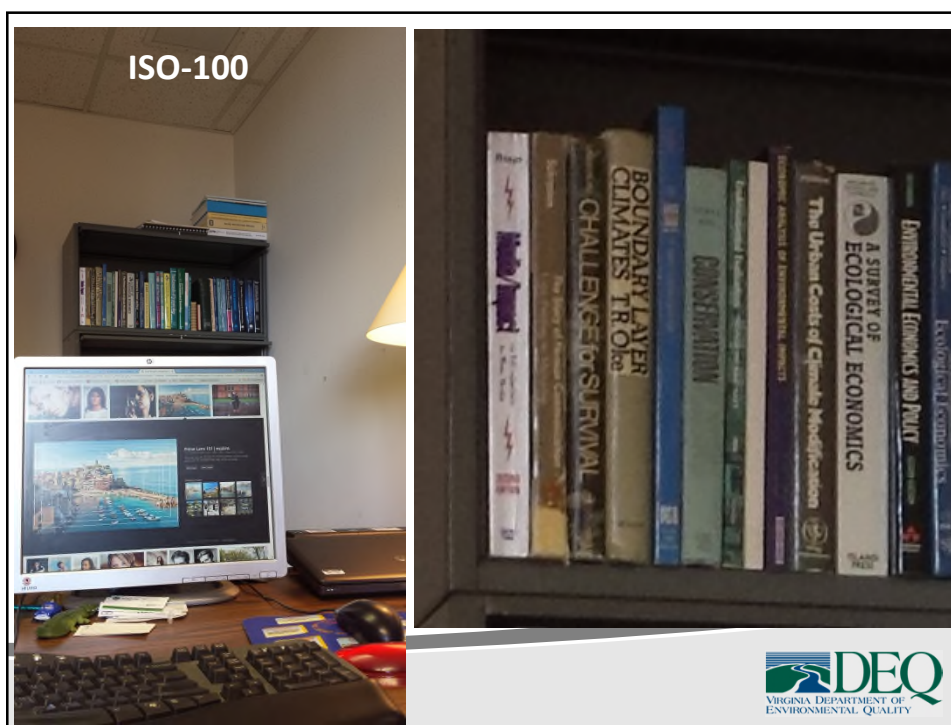
A photograph of a desk setup. A computer monitor displays a website with various images. A keyboard and mouse are visible on the desk. In the background, there is a bookshelf filled with books. The text 'ISO-Auto' is overlaid in the top left corner.



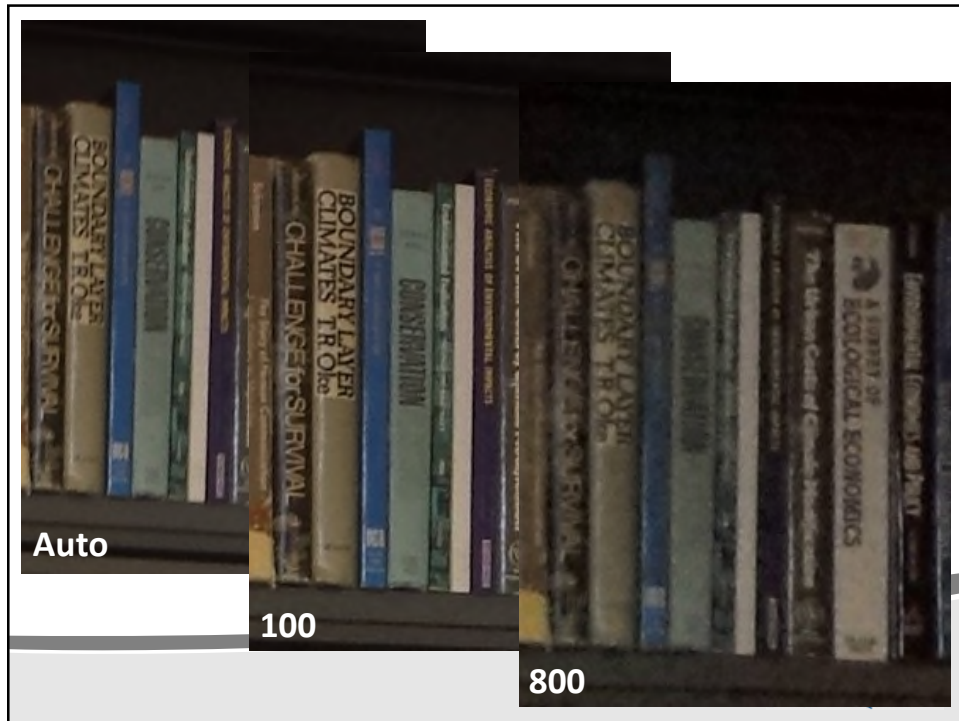
A close-up photograph of a bookshelf filled with books. The spines of the books are visible, showing various titles and colors.





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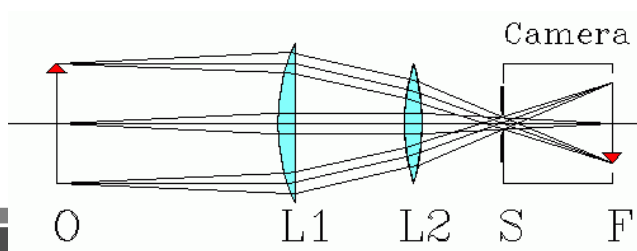
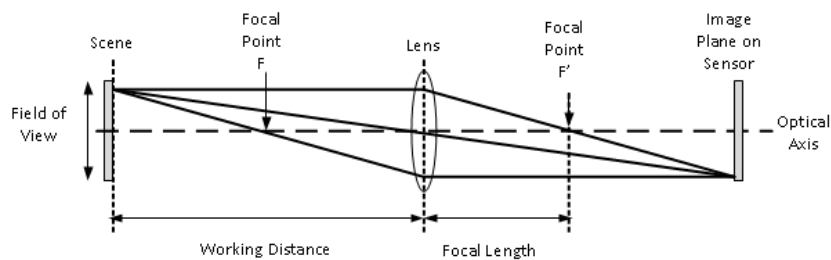




**The Lens**

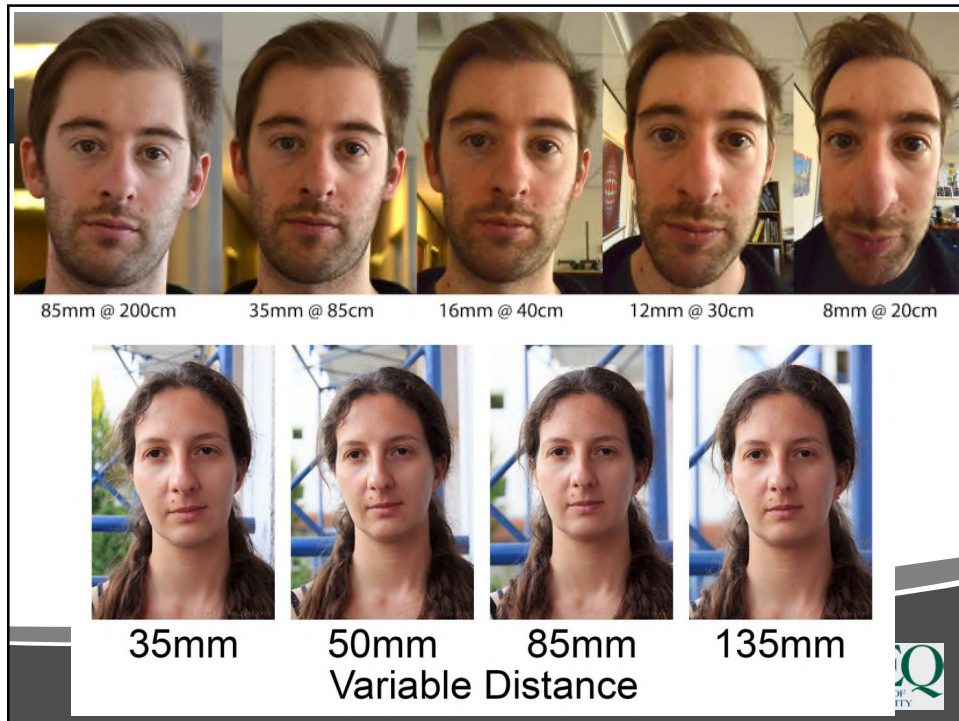


## The Lens



## Lens length





## Aperture and shutter speed

**Aperture**

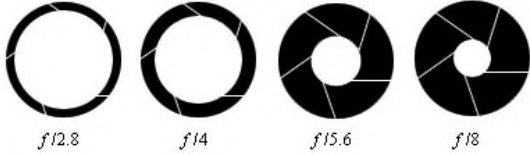
More Light      Less Light

f2    f2.8    f4    f5.6    f8    f11    f16

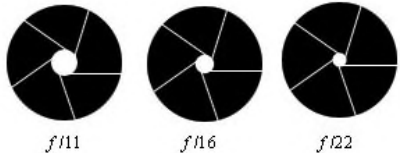
**Shutter Speed**

1/1000   1/500   1/250   1/125   1/60   1/30   1/15


Less Light      More Light




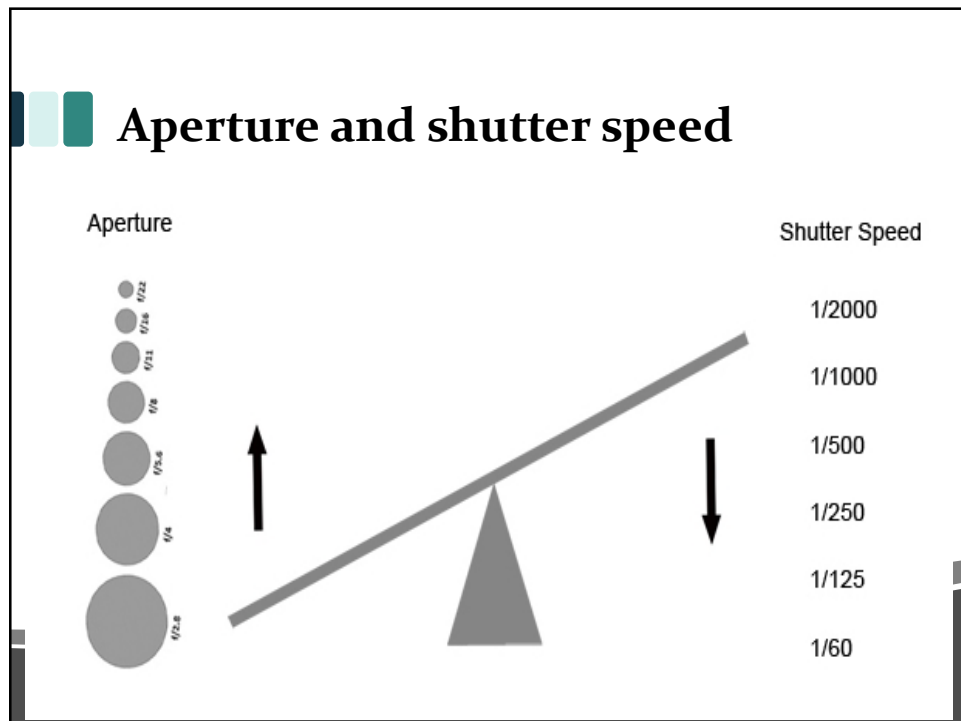
*f/2.8*      *f/4*      *f/5.6*      *f/8*



*f/11*      *f/16*      *f/22*





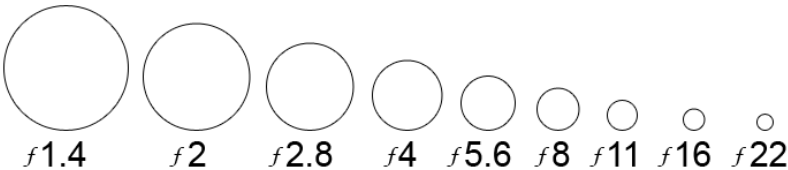




Dark and need more light! Too Bright !

**Aperture** ⇒ Size of Opening. **Creative:** Controls Depth of Field.

⇐ shallow DOF large DOF ⇒



f1.4 f2 f2.8 f4 f5.6 f8 f11 f16 f22

more light less light

B 1 2 4 8 15 30 60 125 250 500 1000

⇐ more blur less blur ⇒

**Shutter Speed** ⇒ Duration the shutter is open in fractions of seconds or full seconds. **Creative:** Controls Both Motion Blur and Camera Shake.


more light less light

3200 1600 800 400 200 100 50 25

⇐ more grain less grain ⇒

**ISO (ASA/DIN) Film Speed** ⇒ Sensitivity to available light. **Creative:** Film Graininess.

## Aperture and shutter speed



**Nomenclature**

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  - HDR Backlight Control (p.86)

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## Shutter Speed



Blurred motion



## Frozen motion



1/8 1/15 1/30 1/60 1/125 1/250

Decrease exposure ○○○○○○○○

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## Shutter Speed Cheat Sheet

## Freeze Movement Easily Handheld

Hand Hold  
Carefully

### Movement Blur Use a Tripod

$$\overbrace{1/8000 \ 1/4000 \ 1/2000 \ 1/1000 \ 1/500 \ 1/250} \quad \overbrace{1/125 \ 1/60} \quad \overbrace{1/30 \ 1/15 \ 1/8 \ 1/4} \quad \overbrace{1/2 \ 1 \ 2 \ 4 \ 8 \ 15 \ 30}$$

- Faster Shutter Speeds
- Less Time the Shutter Remains Open
- Less Light Strikes Image Sensor
- Freezes Motion
- Less image noise/grain

- Slower Shutter Speeds
- More Time the Shutter Remains Open
- More Light Strikes Image Sensor
- Slows Motion
- More image noise/grain

## Shutter speed

## Effects of Different Shutter Speed



@ Shutter Speed 1/320 Sec



@ Shutter Speed 1/60 Sec



@ Shutter Speed 1/15 Sec

www.DigitalPhotographyLive.com



## Speed and Focal Length

# Shutter speed

**Shutter Speed Rule:** Choose a shutter speed with a denominator that is larger than the focal length of the lens.

**28mm Wide Lens – Use at least 1/30**  
**55mm Standard Lens – Use at least 1/60**  
**200mm Telephoto – Use at least 1/250**

## Shutter Speed Guide

SUBJECT OR SCENE	SHUTTER SPEED	COMMENTS
Still Life (Motionless)	1 to 1/4000	Speed is not Important
Landscape and Nature Scenes	1/30 and Upwards	Leaves can move in the wind
Human Interaction	1/60 to 1/125	1/125 – Minimum for Musicians
Band/Concert / Dancing	1/60 to 1/1000	Depends on Lighting and Blur
Young Children (Under 12yo)	1/125 to 1/500	Use Multi Shot as well
Running and Jumping	1/250 to 1/2000	1/2000 for Outdoor Athletics
Horse Galloping	1/250 to 1/2000	Rodeo Events – Minimum 1/1000
Football / Soccer / Basketball	1/250 to 1/2000	Most Sports + Use Multishot
Birds and Animal Wildlife	1/250 to 1/4000	Use Multi Shot as well
Car / Motorbike / Speedboat	1/500 to 1/4000	Multi Shot + Can do "Panning Blur"
Air Show / Car Racing	1/1000 to 1/4000	Can do Panning Blur on Race Car

Note: "Panning Blur" involves moving the camera sideways while shooting to blur background

## APERTURE SCALE

Large aperture ← → Small aperture

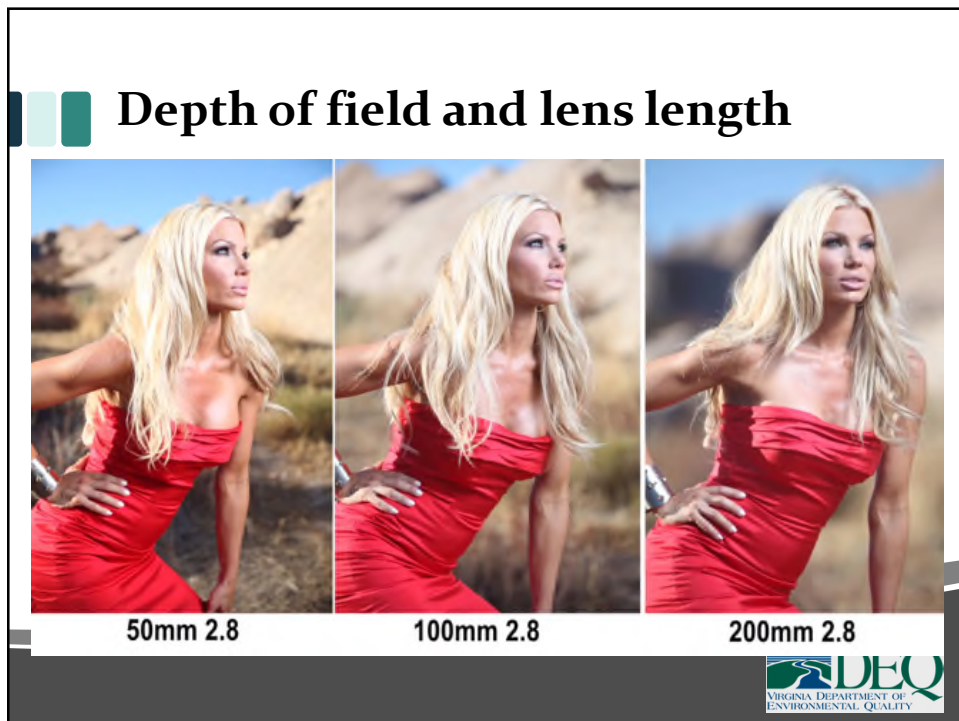
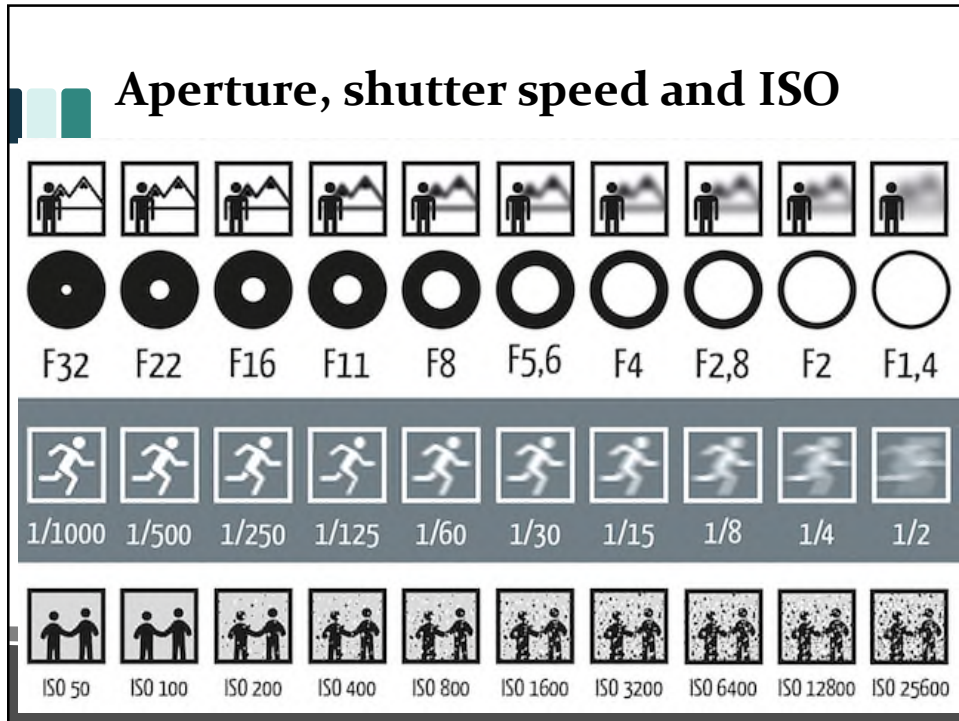
More light strikes image sensor ← → Less light strikes image sensor

Shallow Depth of Field (Focus) ← → Deep Depth of Field (Focus)

f/16      f/4      f/1.4







## Focusing



## Focusing



### Where do you focus with a camera?

- What do you want in focus?
  - Want it all? → Increase the ISO or decrease the shutter speed which decreases the aperture
  - Want less? → Decreases the ISO or increase the shutter speed which increases the aperture
- With touch screen (phones) move the focus/light meter point
- Some SLRs have variable focusing points
- Point at the subject, push in the shutter halfway then move the camera to frame the scene while holding the shutter button then finally take the picture.

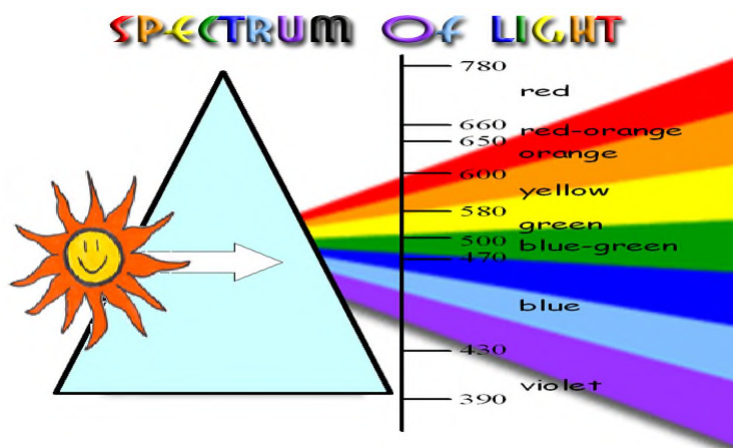


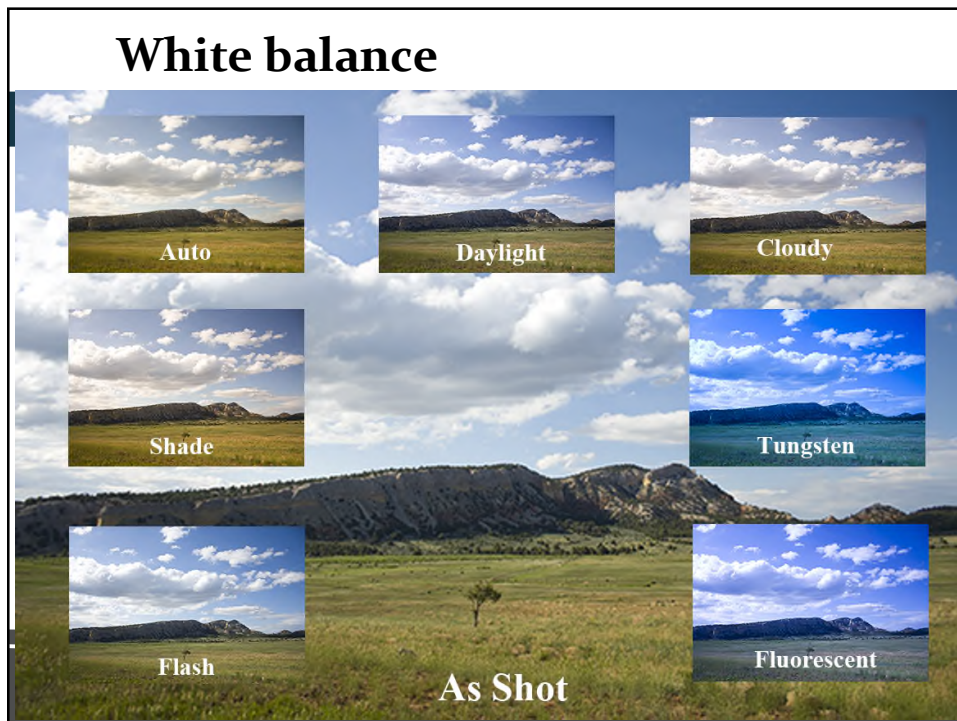
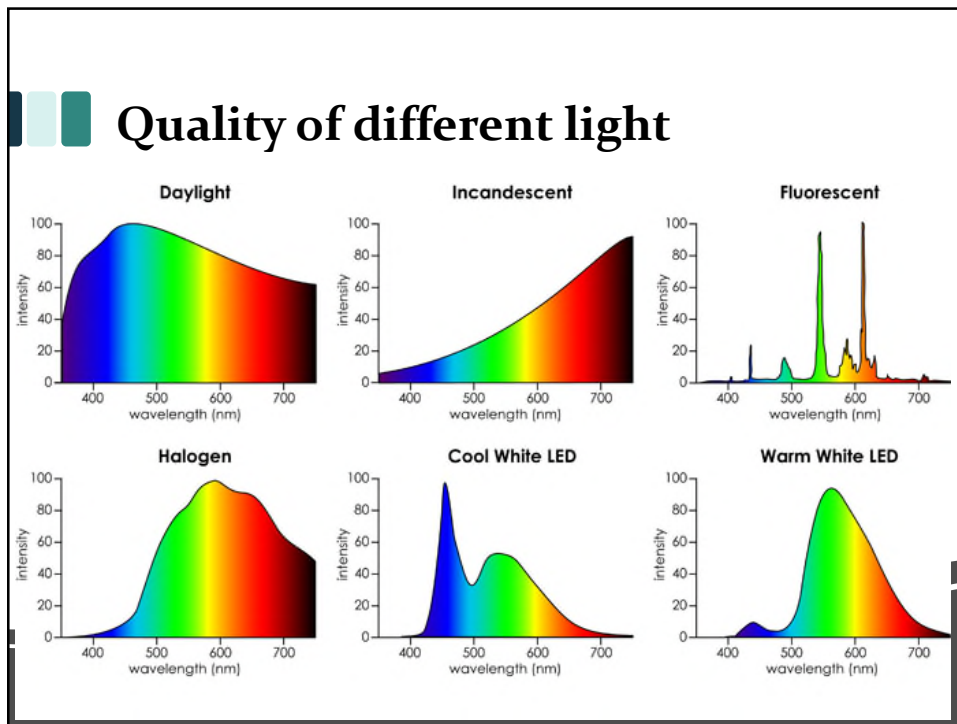


## White Balance



## White Balance





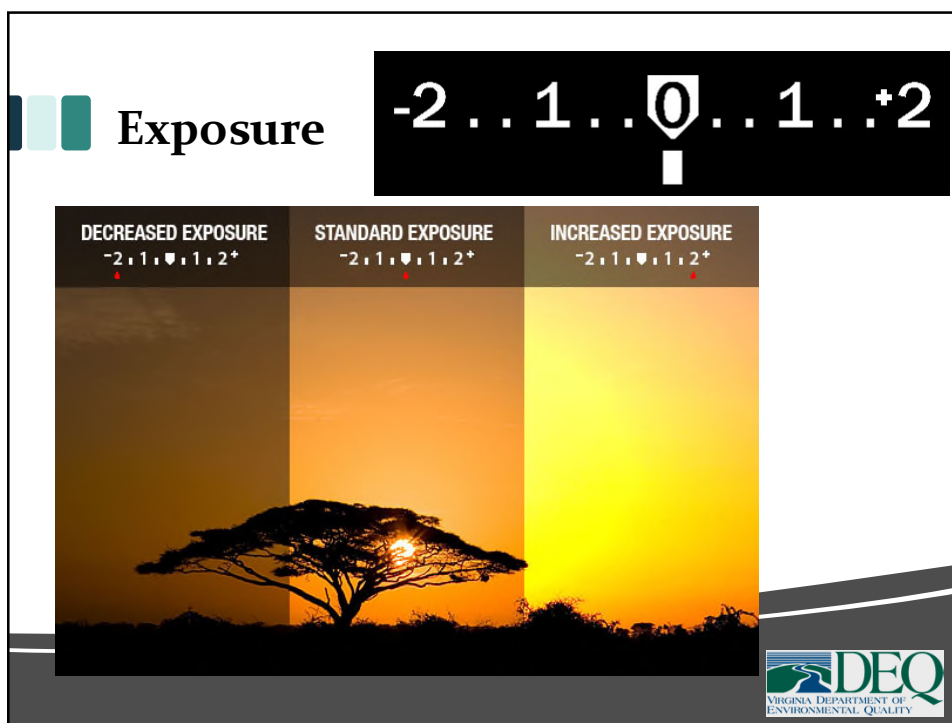


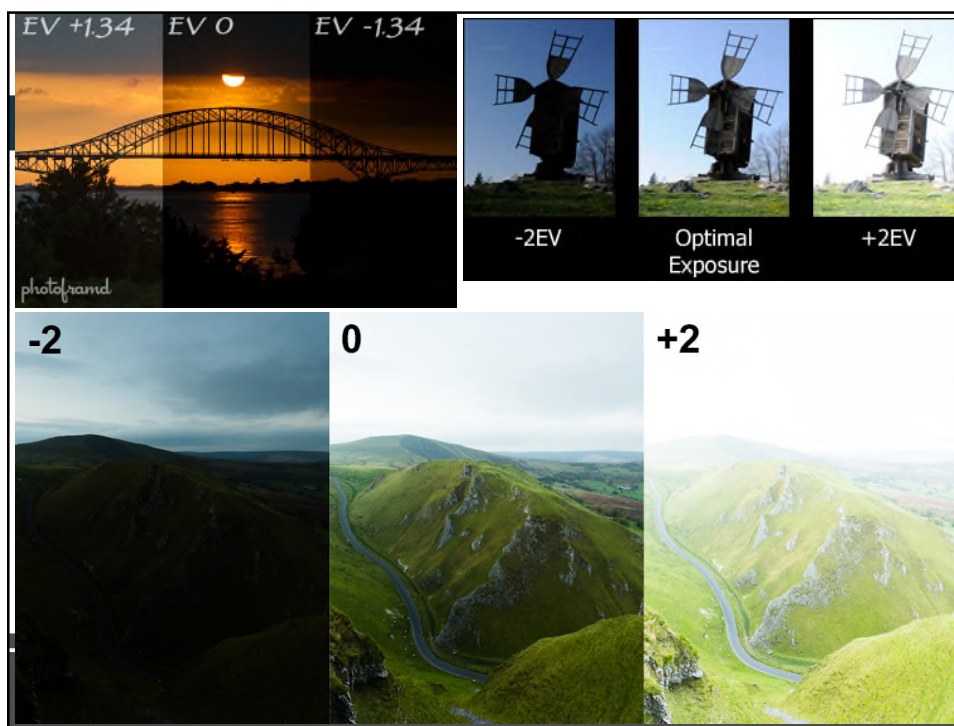
## White balance



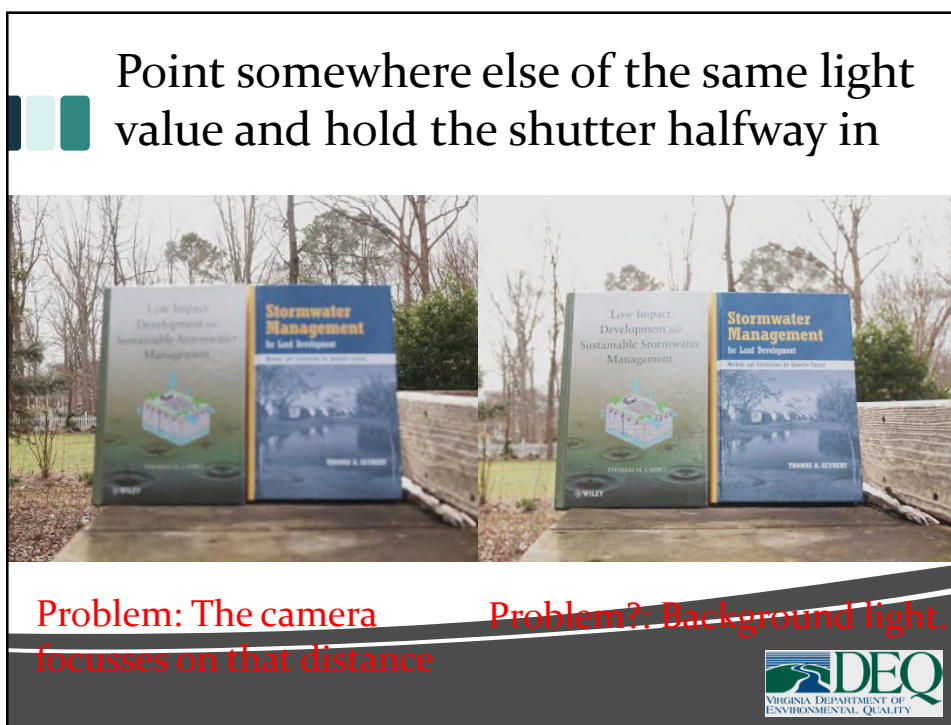
## Exposure







# Back Lighting





## Use Reflectors



- Metal clipboard
- White sheet of paper
- Neutral color (white, grey or silver)
- Do not use your safety vest, unless you change the white balance, otherwise everything looks yellow.
- Do not focus a beam of light.



## Basic Composition



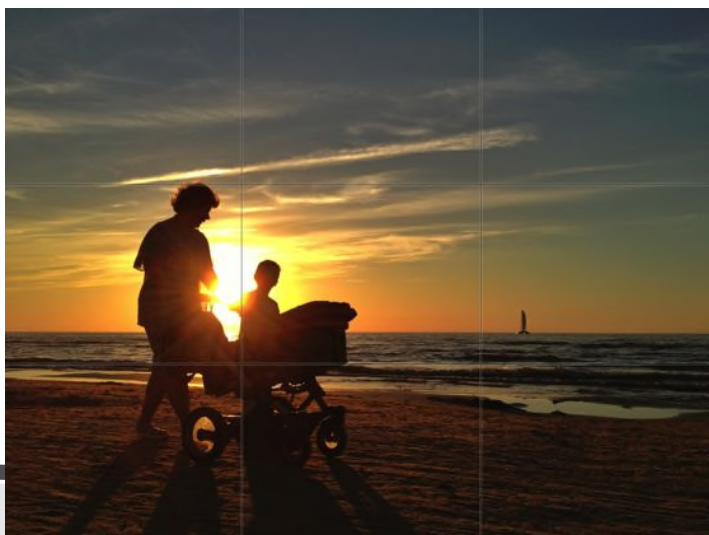
## Basic Composition

1. Keep it simple
2. Keep the clutter out of the picture
3. Keep the subject matter off-center
4. Lead the eye to the subject matter
5. Use a diagonal line to lead the eye to the subject matter
6. Find framing devices
7. Don't be afraid to break the rules

<http://www.digitalcameraworld.com/2012/04/12/10-rules-of-photo-composition-and-why-they-work/>



## Basic Composition (The rule of thirds)



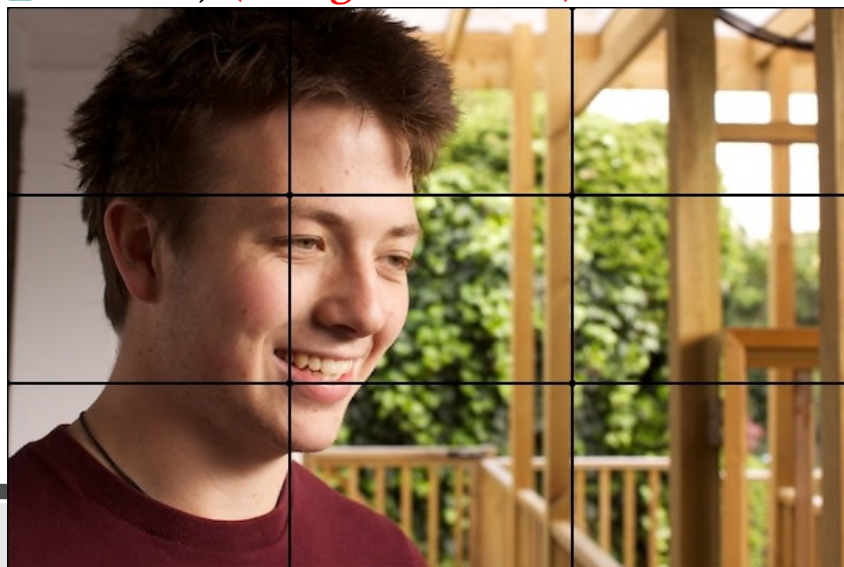
## Basic Composition (The rule of thirds)



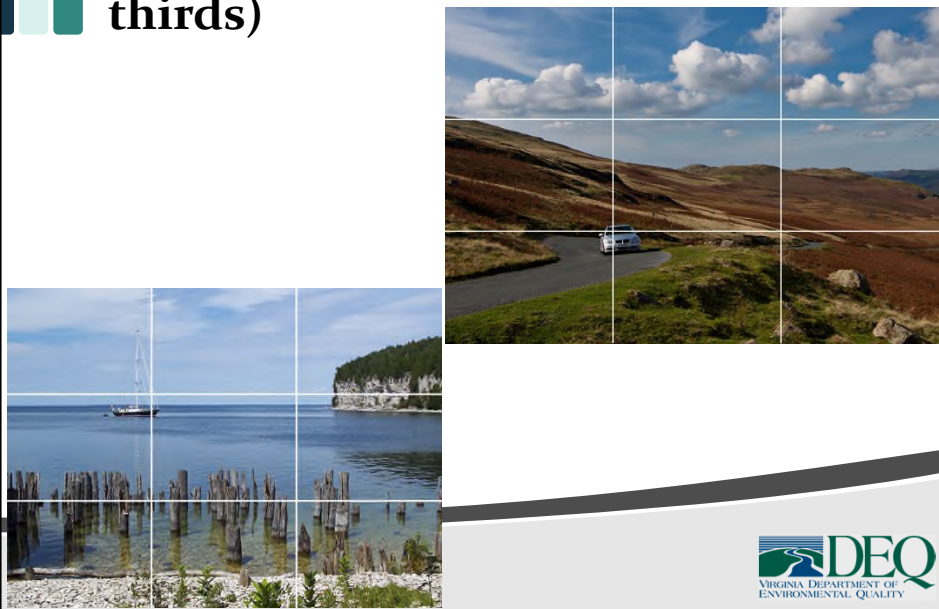
## Basic Composition (The rule of thirds) (+diagonal +lead +frame)



## Basic Composition (The rule of thirds) (+diagonal +lead)



## Basic Composition (The rule of thirds)





## Basic Composition (The rule of thirds)



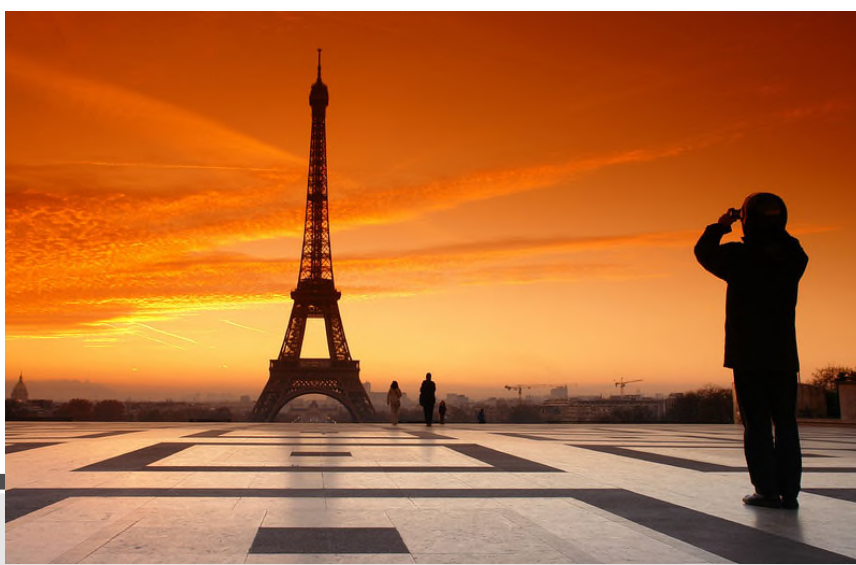
## Basic Composition (The rule of thirds)



## Basic Composition (Lead the eye to the subject matter)



## Basic Composition (Lead the eye to the subject matter)



## Basic Composition (Lead the eye to the subject matter)

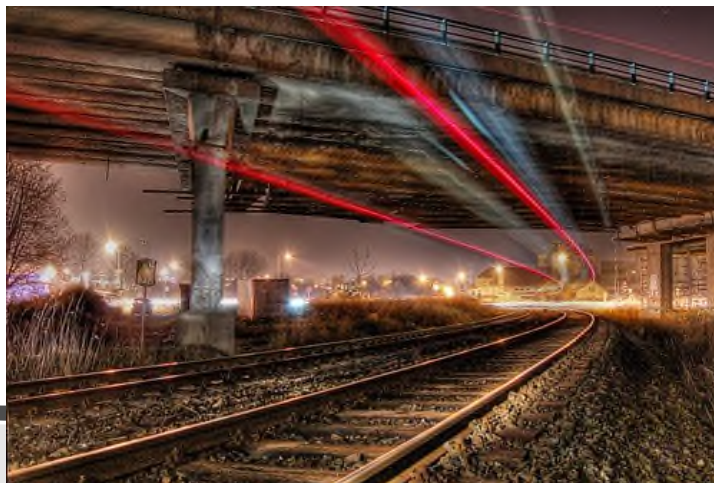


## Basic Composition (Lead the eye to the subject matter)





## Basic Composition (Use the diagonal)



## Basic Composition (Use the diagonal)

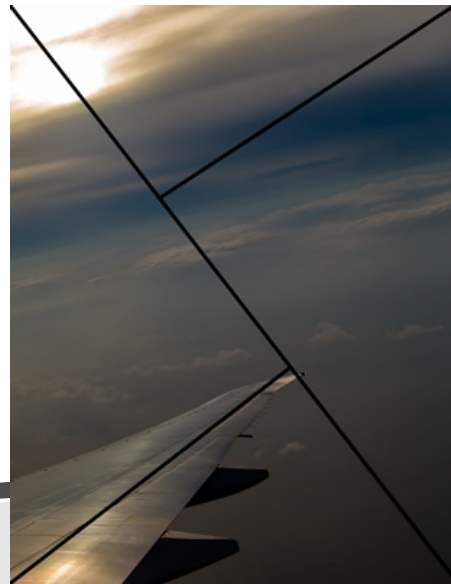
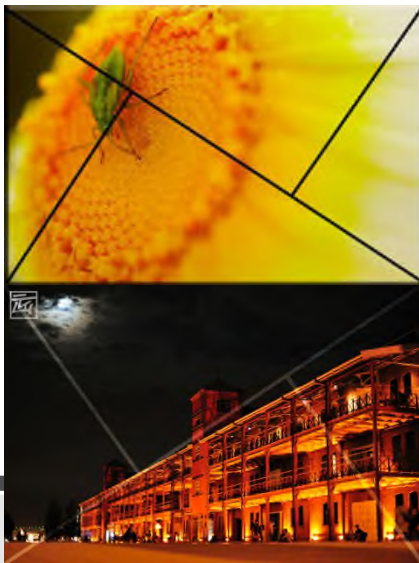




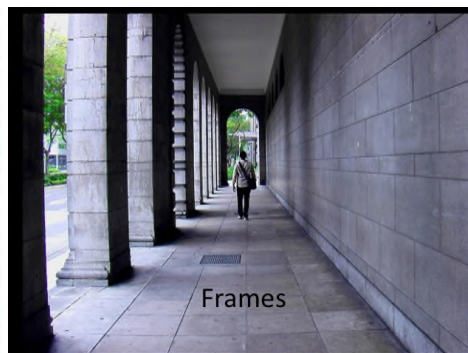
## Basic Composition



## Basic Composition (Golden triangle)



## Basic Composition (Frame)



+ symmetry!



## Composition (Don't be afraid to break the rules)



## Composition (Don't be afraid to break the rules)



**+ powerful  
subject &  
symmetry!**



## Composition (Don't be afraid to break the rules and have some fun!)



## Just remember

- These are just some guidelines
- But the most boring is probably
  - To keep the horizon in the middle of the picture
  - Clutter
  - Subject in the center, unless fun or symmetric



## End of Module 2

Questions?